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Can We Stop Polio?

A radio discussion over WGN and the Mutual Broadcasting System in cooperation with the Cook County Chapter, National Foundation For Infantile Paralysis

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Can We Stop Polio?

MR. MCBURNEY: Mrs. Karlsteen and gentlemen, this is the season of the year in which polio often reaches epidemic proportions. Mrs. Karlsteen, can you give us some idea of the extent of the disease this year?

MRS. KARLSTEEN: Good news, Mr. McBurney. As of August 12, we are running nationally 9,000 against 14,000 a year ago. That is good news nationally, and this picture is pretty much true locally.

MR. MCBURNEY: Do you think, Dr. Buchanan, that the cooler summer, the cooler weather generally is responsible for this good news that Mrs. Karlsteen has given us?

DR. BUCHANAN: I think it must be. It seems each year the epidemic tends to die, though not completely, whenever the temperature drops.

MR. MCBURNEY: Has the disease increased over a period of years?

Disease Increase

MRS. KARLSTEEN: Yes, at the present time—since 1946—we have noticed a definite upswing in the disease, certainly in the United States, and since 1947 all over the world. I would say that the statistics from 1942 to 1948 would show between 12,000 and 14,000 as an average year. In 1948 we had over 26,000 and in 1949 over 42,000.

MR. MCBURNEY: 1949 was your worst year?

MRS. KARLSTEEN: The worst one in history.

MR. MCBURNEY: What people does polio select, Dr. Compere? Is it essentially a children's disease?

DR. COMPERE: It is not essentially a children's disease. Poliomyelitis is no respector of persons or of ages, although more children have the disease than do adults for perhaps several reasons. Many adults probably have had the disease in such a mild form that no diagnosis was made, and hence they do have immunological substances within their bodies which make them more resistant to the disease.

It is of some interest perhaps, that people who live in rural areas are more likely to have this disease than those who live in the cities where there is more congestion and crowding.

MR. MCBURNEY: How do you account for that, or can you account for it?

Rural and Urban Areas

DR. COMPERE: We can offer some possible explanations. In the rural areas, sanitation may not be as good as it is in the city where we have public health departments constantly on the job. Also, flies and other insects which may be vectors in spreading this disease are much more numerous around barns, on farms, and the drinking water in many forms may not be as pure as it should be.

As an example, in 1949, the number of people who had poliomyelitis in Chicago or in New York City was about 35 per 100,000 population, while in some of our northwestern states, such as Wyoming, Montana, or Idaho, the incidence of poliomyelitis was more than twice that high. These

are states where the population is scattered, where there are no large cities, and yet there were 65 to 85 cases of polio for each 100,000 population in those rural areas.

MR. MCBURNEY: Is that, then, your experience with this disease, Dr. Buchanan?

DR. BUCHANAN: My experience has been purely in the cities. By reading, I have learned a good deal about it.

MR. MCBURNEY: How deadly a disease is this?

DR. BUCHANAN: It is not as deadly as many people perhaps imagine. At least 50% of the people who have this disease, even in the phase in which the nervous system is infected do recover from it and recover from it completely, and the actual death rate is much lower than that of such other diseases as carcinoma or heart disease, so it is not a deadly disease in the sense that those others are.

Percentage of Crippled

MR. MCBURNEY: What percentage of people are crippled as a result of infantile paralysis, Mrs. Karlsteen?

MRS. KARLSTEEN: About 15% to 20% are pretty seriously crippled, despite treatment, of which 8% die. Forty to 50% get well completely, and about 25% to 35% will have some slight paralysis, but nothing to interfere with normal living. It would have a residual effect, but by treatment, it wouldn't have too damaging an effect.

MR. MCBURNEY: Are these statistics improving as a result of modern surgery, would you say, Dr. Compere?

DR. COMPERE: Yes, at least, there are fewer individuals who are being left totally disabled, or so severely disabled that they could not obtain employment, because we are succeeding in preventing many of the deformities which formerly occurred as a result of no treatment. Curvature of the spine, for instance, following a severe paralysis may be severe enough to be totally disabling to the individual. Many of these curvatures can be prevented by good orthopedic procedures and physical therapy. Those that develop in spite of treatment can usually be checked or corrected if recognized early and the spine can be made strong by an operation known as a spinal fusion using bone grafts.

MR. MCBURNEY: I think most people have the impression, Dr. Buchanan, that infantile paralysis or polio is a relatively recent disease. I know from what you have said that isn't the case. Briefly, what is its history? How long have we known this disease?

DR. BUCHANAN: The disease known as infantile paralysis has been so known only for about 100 years, but historically, of course, the disease must have existed before that.

The first actual reference to the evidence that poliomyelitis existed a long time ago was the finding of a skeleton by Flanders Petrie near Cairo. This skeleton was calculated to have been there since between 3000 or 4000 B.C. In this skeleton, the left leg was shorter than the right and the changes in the bone were perfectly comparable with the diagnosis of poliomyelitis. Another example of this has been found in Egypt, a skeleton as old as 1500 B.C., Priest Ruma of the Temple of Astarte at Memphis, whose right leg was withered.

Hippocrates, himself had some statements in his *Epidemic Paraplegia* and we know those references were made to what is now called poliomyelitis.

Polio in Recent History

In addition, a much later example, Sir Walter Scott obviously suffered from polio and according to the history of his life developed his when he was a year and a half old. It came on in the classic pattern, after a period of three days of fever. The fourth day he was found to have a complete paralysis of his right leg. This, of course, persisted throughout his life.

The first person who described polio

in a medical sense was a man named Underwood in 1784. Then the actual use of the term "infantile paralysis" was introduced by the Frenchman Duchenne in 1845. There are two people whose names are referred to, Heine and Medin. Those were people who studied epidemics, and the latter was probably the first person who realized this was an infectious disease. The fact that this was a disease essentially of the nervous system, and not of any other part of the body was not known until 1905, and that was not long ago. This was described by Wickman.

The last two particular points in the history were these: In 1908 Landsteiner was able to transfer this disease to a monkey and prove this was the same disease as happened in a human being; a year later, Flexner demonstrated this disease was caused by a virus.

MR. MCBURNEY: You said something that interests me very much. Are animals then, not carriers of this disease?

DR. BUCHANAN: There are two diseases which are in all probability very similar to the polio which affects human beings. One is a disease which occurs in swine and has a specific name with veterinarians, and a similar disease occurs in mice. Those are virus diseases and the viruses that cause those two diseases in swine and mice, have many characteristics similar to those of the polio virus which is under discussion at the present moment. So there are animals which carry a disease somewhat like polio and in many respects their diseases are "first cousins" of it.

'Disease of Nervous System'

MR. MCBURNEY: Dr. Buchanan has referred to this as a disease of the nervous system, Dr. Compere. I think many people think of it as a respiratory disease.

DR. COMPERE: Until a few years ago, the statement was sometimes made that poliomyelitis and the summer cold were probably one and the same thing. In some instances the victim of the summer cold became paralyzed, and in other instances he did not. We know now that that is not true. The virus is found in the nose and nasal-pharynx of the patients who are acutely ill with poliomyelitis. But the virus reaches the central nervous system through the gastro-intestinal tract. Hence those who become ill with poliomyelitis are contaminated probably, or become infected probably through drinking water that contains the virus, or eating food that has been contaminated by other handlers who were carriers of the disease, or patients who were ill with the disease, or flies or other insects which may have become contaminated with the virus and then light on the food, leaving virus which can be taken into the mouth and into the intestinal tract. Then it spreads from the intestinal tract to the nervous system and probably along the nerve pathways.

'Virus Enters Nervous System'

DR. BUCHANAN: I think it should be mentioned at this point that no one has accurately demonstrated the presence of the virus of polio in the blood stream and seldom if ever in the lymph gland. As Dr. Compere has said, it has been demonstrated in the nose and throat and intestines of those who have this infection. It is of interest that this virus has been found for two or three days in the nose and throat and four or five weeks in the intestines of a person who has the disease. The admission of the virus from the alimentary tract into the nervous system is done by a peculiar characteristic which this virus has. It travels along a nerve at the nerve axon, and it will continue to do what most infections do, travel by the blood stream or adrenal system, along the axon and will reach the level of the alimentary tract and get into the nervous system. It can do this at various levels through the little intestine.

It is of interest with reference to the fact that a majority of people who have polio are more liable to have weakness and trouble with the legs than they are with the middle of the body, or much more trouble with the legs than their arms. In all probability, the virus as it leaves the intestine goes into the nervous system along particular gray pathways which exist between the intestines and the nervous system. It so happens in the nervous system there are two specific places throughout a person's neural axis in which there are gray fibers which do not have the usual variety of insulation or medulation on the outside. Those places where the gray fibers exist are the cervical region and lower part of the lumbar cord. It may well be this is the usual route of its going from the intestines into the nervous system and that is the reason that the majority of human beings who have the disease are more liable to have trouble with their legs or arms.

'Multiple Viruses'

DR. COMPERE: It might be explained at this point that there are several viruses, a family of viruses closely related, but not identical, which can produce the illness which we recognize clinically as poliomyelitis. Three of these viruses have been definitely identified. We know there are other viruses; how many strains of virus can produce poliomyelitis, we do not yet know.

One of the most important things that we need to learn about this disease is exactly which viruses cause it, how many of them there are, and how to identify each one. Studies to try to determine these facts are being carried on now in several leading universities under grants supplied by the National Foundation for Infantile Paralysis. When these facts are known, it will be much more likely that vaccines can be developed, polyvalent vaccines, or vaccines made from all of the known viruses which can produce poliomyelitis, and such vaccines then would have a good chance of producing immunity if they are used for that purpose.

MRS. KARLSTEEN: I suppose when you speak of the several strains of virus, Dr. Compere, that would perhaps give us a reason to believe that some people can be stricken with polio more than once? We have had a few instances in our experience, which I would say were very rare. What are the scientific facts on that? Can people get polio more than once? Is it truly polio the second time?

DR. COMPERE: That question has been asked by scientists and by many lay people. One attack of poliomyelitis confers some immunity, probably complete immunity to that particular virus which produced the attack of poliomyelitis. However, I have had two patients who have had two definite attacks of poliomyelitis, seven to ten years apart, and in each instance producing paralysis. That doesn't mean that that patient was not immune to an attack from the same virus that produced the first attack. In all probability, it was a different virus that produced the second attack. It can be stated however, from statistical studies and stated very definitely that any person who has had poliomyelitis once is extremely unlikely to ever have another attack.

MR. MCBURNEY: Can you have polio without knowing it, Dr. Buchanan?

Prevalence of Infection

DR. BUCHANAN: If you mean by that the fact a person may have the invasion of the virus in some way into his body, and yet there is no clinical evidence of infection, no clinical evidence of weakness or paralysis, of course that is true. Many people do have the infection and this may come when they are young or old. They have no knowledge of it. The infection has happened.

Again, as mentioned earlier, this may have been looked upon as an upper respiratory infection. Such a per-

son however, must have had the infection and a large majority of the population of grown-up people do carry immune bodies in the blood against the actual specific virus, at least against two or three types of virus. Such people must have acquired this infection in all probability in childhood sometime when no one knew they were suffering from the disease at present under discussion. There are many people who have the infection this way and do not know they have it. This is to their own good advantage. It means they are in all probability immune.

MRS. KARLSTEEN: Dr. Buchanan, I am thinking in terms of the questions that come to the National Foundation for Infantile Paralysis from parents and those concerned about children, I would say many times unduly concerned. One of the things we have said to them is to avoid over-fatigue. I think that has been interpreted almost as a hibernating for the summer months. Many of our patients are afraid to have their children engage in normal sports. They want them to rest all the time. What about the business of avoiding over-fatigue?

Precautions During Illness

DR. BUCHANAN: I think it is true with a person who is at the critical point of his infection in which the virus itself is about to invade the nervous system that if that person at that time exercises more than usual, or is cooled and chilled more than usual, that it may in all probability produce a greater weakness after the illness has gone. That is experimental evidence in animals. It is possible to increase the severity of disease and increase the rate of infectivity of animals who have been heavily exercised and heavily chilled after the inoculation of the virus. It is true as a practical measure, if a person is suffering from this disease in an early stage before it has invaded his nervous system—just at the point it is about to do this—if this person exercises more than normally, he probably is in some danger of doing himself harm, which if he had rested, would have been avoided.

However, this has nothing to do with the question of a person, during a time when polio is present in a community, having no exercise, doing nothing. It makes no difference whether the person exercises as much as he wants to before the specific virus enters his body and is at that critical point about to invade his nervous system. At that time exercise increases the blood supply in the region of the axons from his alimentary tract into his nervous system. It is true that will drive the virus more quickly into the nervous system and drive it further within the confines of the nervous system. Exercises for a person who has the infection at the critical point is probably bad.

MRS. KARLSTEEN: In other words, we would give our parents good advice if we asked them to put the child to bed when he is ill and have the doctor decide what the difficulty is and just keep the patient quiet during the time that he may be having the beginning of an acute infection. I think that is helpful because so many of our families feel that during the polio season, they don't want to go to camps or parks, they don't want to swim, they want to be very quiet and this upsets the normal routine of life. I think that all of this terrific caution which puts them in an unsure state is very bad for the community.

MR. MCBURNEY: What do you say to that, Dr. Compere?

Swimming Pools

DR. COMPERE: I would agree for the most part. I do think that the chances of swimming pools, especially small, artificial pools becoming contaminated with the virus from swimmers who perhaps are not ill at the time but carriers of the virus and swimmers beginning to become ill, and hence having the virus within their intestines in large quantities, is great

enough that during the months of August and September, it would be wise to keep normal children away from those pools or else to close the pools as has been done in many of our cities.

MR. MCBURNEY: You are hard on swimming pools. How about theatres and other public gatherings? Schools, for example?

DR. COMPERE: That is a very good question. It is a question which comes up every year and which our public officials have to answer and to reach some decision. The mayor has asked, "Should we close the schools?" Letters are written in, "Shouldn't we close the schools because there is polio in the community?" The facts are that this is a disease in which the spread is by way of the mouth and the gastro-intestinal tract, at least in most cases.

MR. MCBURNEY: Food, water, or food and water contaminated by flies, insects and the like?

Direct Contact

DR. COMPERE: Or by the patient who has polio. Just direct contact between a normal individual and a person who is ill with poliomyelitis carries almost no risk. One can occupy a bed next to a bed in which there is an acute case of poliomyelitis, and stand very little chance of getting the disease, provided normal nursing procedures are followed, particularly repeated washing of the hands on the part of the nurses or doctors who go from one bed to another. That has been shown where there is no quarantine for poliomyelitis. If a patient acutely ill with the disease is brought into the open ward with other patients, it has been shown that in no instance has the well patient, or the patient with the broken leg but no illness, ever caught the disease in these wards.

So there is no good reason for closing the schools. As a matter of fact, children are safer in school than playing in the streets or alleys as they would be doing if school were not opened at the regular time. As soon as school is open here in Chicago every year—possibly because we are beginning to get cooler weather by that time, and also because of the better control of the children—the incidence of poliomyelitis is down.

MR. MCBURNEY: Dr. Buchanan, is there any evidence to show that certain people are less susceptible to polio than others? I am thinking in terms of this research by Sabin.

DR. BUCHANAN: Sabin of Cincinnati has brought out one of the most interesting things that has come out on polio. In primitive countries it seems to be true that small children are less liable to acquire the infection, or if they do have it, it is in a much less serious form. By observation and by testing, it seems to be true there is some peculiar substance present in human milk and specifically at the beginning of the child's life. This substance seemed to be in the nature of a protection against virus infection. By considerable work it was demonstrated that this was not just an antibody carried from the blood to the milk, that it was not just a specific protective substance against one virus, but it had a reaction against all viruses. It is of interest to discover that some cow's milk has the same substance and others have none at all. The significance, of course, is entirely unknown. Where it leads is also unknown. It is the first new idea which has come out in the whole process.

MRS. KARLSTEEN: Was that one of the grants supported by the National Foundation for Infantile Paralysis?

DR. BUCHANAN: I believe it was.

Importance of Prevention

DR. COMPERE: If we are to stop polio, we cannot hope to do it simply by adding new operative procedures to repair the damage when there is already paralysis. Polio can only be stopped by finding a means of preventing it such as the vaccines, toxoids,

and so forth which have prevented other contagious infectious diseases, and our only hope for that is to continue to obtain support for research projects such as are being carried on now in the laboratories of almost every university in this country, and research that has been supported by the National Foundation for Infantile Paralysis, a source of support for which there is no substitute today.

MR. MCBURNEY: How are these polio cases handled when you do get them in the hospital, doctor? Have you made progress in surgery that is significant?

DR. COMPERE: Many operations have been perfected by which it is possible to make an arm or leg that had been relatively useless due to paralysis, become a useful member, but that is at best just patching.

MR. MCBURNEY: Your emphasis is on prevention, and I take it the National Foundation for Infantile Paralysis which you represent is contributing in that direction.

MRS. KARLSTEEN: Yes.

Suggested Readings

Compiled by Barbara Wynn, Assistant, Reference Department, Deering Library, Northwestern University

BERG, ROLAND H. *Challenge of Polio: The Crusade Against Infantile Paralysis.* New York, Dial Press, Inc., 1946.

An over-all study for the layman. Contains a chapter on F. D. R.'s triumph over polio.

BLAKESLEE, ALTON L. *Polio Can Be Conquered.* Public Affairs Pamphlet No. 150. New York, Public Affairs Committee, Inc., 1949.

An optimistic summary on causes, symptoms, treatment, and cost of treatment.

KENNY, ELIZABETH, and OSTENSO, MARTHA. *And They Shall Walk.* New York, Dodd, Mead, 1943.

The life story of Sister Kenny.

PLAGEMANN, B. *My Place to Stand.* New York, Farrar, Straus, 1949.

A polio victim's personal account.

POHL, JOHN FLORIAN M., and KENNY, ELIZABETH. *Kenny Concept of Infantile Paralysis and its Treatment.* St. Paul, Minnesota, Bruce, 1943.

A comprehensive description of the Kenny treatment.

WEAVER, HARRY M. *The Research Story of Infantile Paralysis.* New York, National Foundation for Infantile Paralysis, 1948.

The Director of Research of the National Foundation for Infantile Paralysis discusses the research activities of the Foundation.

American Mercury 59::610-16, N., '44. "Truth About Sister Kenny." A. DEUTSCH.

An interesting report on the controversy over the Kenny method.

Better Homes and Gardens 27:29+, Ag., '49. "Are We Getting Anywhere with Polio?" M. Z. GROSS.

Notes the new advances in fighting bulbar polio, and the new use of the drug, curare.

Collier's 125:13-14+, My. 27, '50. "If Polio Strikes, Is Your Town Ready?" A. Q. MAISEL.

Tells what happens when the fight against polio is hastily organized. "Catch-as-catch can medical herbism" should not have to "pinch-hit for community planning."

Consumer Reports 14:78-81, F., '49. "Polio; Story of Conflicting Personalities and Treatments." H. AARON.

Describes the competition between the National Foundation for Infantile Paralysis and the Sister Kenny Foundation.

Coronet 27:53-6, Ja., '50. "When Greensboro Licked Polio." E. MILLER.

How one town met the crisis of a polio epidemic.

Hygeia 27:540-1+, Ag., '49. "How Does Polio Spread?" E. O. NICHOLS, JR.

What's known and what isn't about the ways in which polio is spread.

Journal of the American Medical Association 131:1411-1419, Ag. 24, '46: "Infantile Paralysis or Poliomyelitis; A Brief Primer of the Disease and its Treatment." EDWARD COMPERE and others.

Basic facts on polio and methods of treatment.

Ladies' Home Journal 67:133-4, Jl., '50: "Protecting Your Child from Polio." H. N. BUNDESEN.

Advice from a noted specialist.

Life 27:46-8+, Ag. 15, '49. "Polio."

Good diagrams and pictures show what happens to the muscles and nerve cells with polio.

Life 27:92-4+, Ag. 15, '49. "Poliomyelitis: Case History." B. PLAGEMANN.

An excerpt from "My Place to Stand."

Saturday Evening Post 222:26-7+, S. 17, '49. "Where Are We Now on Polio?" S. M. SPENCER.

A good resume of recent research.

Science Illustrated 2:30-2+, Ag., '47. "Deadliest Type of Polio." R. H. BERG.

A discussion of bulbar polio.

Science Illustrated 3:60-1, Jl., '48. "Gain Against Polio; New Treatment Restores Life to Dead Nerves." W. S. BARTON.

Describes new ways of measuring and overcoming the damage done by polio.

Today's Health 28:14-15+, Jl., '50. "Good News About Polio." T. WHITMAN.

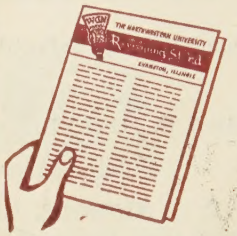
Up-to-date facts on polio. Points out the uselessness of quarantine.

United Nations World 4:50-1, Je., '50. "Front on Which We May Serve." E. ROOSEVELT.

Emphasizes the fact that polio is everywhere, and needs to be fought all over the world as well as at home.

Yale Review n.s. 39, No. 4:647-55, Je., '50. "Controlling Poliomyelitis." J. R. PAUL.

The past and present status of the disease and the possibility of future prevention and cure.



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